REMARKS

Claims 1-2, 8,9,12, 14-18 were rejected under 35 USC 102(b) as being anticipated by Wade (U.S. Patent No. 941215). The rejection of the claims under 35 USC 102(b) is traversed. The Examiner alleges that Wade discloses a thermally conducted mass 10 and a heating means 12.

In the response to the previous arguments the Examiner states that in the broadest interpretation of Wade, the reference reads on the claims since the heater is broadly interpreted as a resistance wire and the electrical insulators combined, and therefore the heater as thus defined is in direct contact with the casing. The Examiner further states that the applicant supports this interpretation in that the applicant states that the Calrod type heating element is known to be a resistant wire embedded in a thermally conductive, electrically insulative material and further surrounded by a metal sleeve or jacket. This statement is partially incorrect. The Calrod type heating element does have a resistant wire. However the resistant wire is sheathed or incapsulated in electrically conductive material which provides the entire heating element. (See Attachments) In contrast, the heating element 12 in Wade is enclosed in insulating material which reduces the thermal efficiency of the element 12 and also preventing the heating element to be in direct contact with the mass.

In addition, Claim 1 requires an insert molded heating means. Wade does not disclose an insert molded heating means. In Wade, the water heater comprises a casing 10 having a recess in one side enclosed by a plate 11 within which the heating element is enclosed (column 1, lines 48-51). Therefore, the heater in Wade is only mounted in a closable recess of the mass and is not a heating means that is insert molded in direct contact with the mass. Further, even if the heating element 12 was not incapsulated in insulation, by placing the heating element 12 in the recess the heating element is still not in direct contact with the mass, and has the same problems that the present invention intends to correct. (See paragraphs [0007] and [0060] of the present invention). The recess in Wade requires clearance for insertion of the heating element 12. The recess formed in Wade for disposition of element 12 causes air gaps between portions of the exterior surfaces of the heater element and the adjacent interior surfaces of the thermal body. Since air acts as an insulator to heat transfer, the air gaps cause a loss of thermal efficiency of the heat transmitted by the heater element to the thermal mass due to the lack of direct contact of the heater elements to the thermal mass. The present invention eliminates the air gaps formed between the plate 11 within the recess and the casing 10 in Wade. Therefore, claim 1 is distinguished from Wade.

Claims 15, and 17-18 were rejected under 35 USC 102 (b) as being anticipated by Bochud (U.S. Patent No. 6,243,535). The rejection of claims 15 and 17-18 are traversed.

Claim 15 requires the step of providing a thermally conductive mass having at least one fluid flow path extending therethrough. Bochud does not show or disclose this feature. Bochud does not disclose any fluid flow paths within the one piece body 1. The only flow path disclosed is formed by hole 13 for connection to a tube extending within the receptacle 7. The tube connected to the hole 13 is NOT formed in the same mass as the heating means 2 and 3 of Bochud. Therefore, claims 15 and 17-18 are distinguished from Bochud.

The Federal Circuit stated that "anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." W.L. Gore and Associates and Garlock, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Circuit 1933). It is clearly evident that neither Wade nor Bochud show each feature of claims 1-2, 8,9,12, 14-18 and 15 and 17-18 respectively.

Claims 15-18 were rejected under 35 USC 103 (a) as being unpatentable over Wade in view of Bochud (US Patent No. 6,243,535). The rejection of claims 15-18 is traversed. Modifying the Wade reference in view of the teachings of Bochud would not render a heater means insert molded in a thermally conductive mass with a substantial portion of the heater means in direct contact with the mass as recited in Claims 15-18. The Wade reference clearly discloses that the heater element 12 must be insulated from the casing by insulating material 13 so that the heater element does not come into contact with the casing (page 1, lines 64-68). Therefore, Wade teaches away from the present invention and from combining it with the Bochud reference.

Further regarding Bochud and Wade disclosures, it would require substantial reconstruction or redesign of both Wade and Bochud to arrive at the claimed invention method as disclosed in Claims 15-18. Bochud discloses that the receptacle 7 and heating bodies 2 and 3 are positioned within the mold. The two-part mold is then closed and the molten aluminum is injected into the mold. Molten aluminum entirely surrounds the heating bodies 2 and 3 and insures upon shrinking or cooling its securement to the stainless steel receptacle 7. In contrast, Wade discloses a casing 10 having a recess on one side for enclosing a plate having a heating element therein. It would require considerable reconfiguration of the Bochud steam generator 2 including removal of the receptacle 7 and reconfiguration of the heating elements 2 and 3 (as shown in figures 7-9 of Bochud) to replace the plate 11 in Wade. Even if these disclosures of Wade and Bochud could be combined without extensive reconfiguration, one would still not have the invention as disclosed in claims 15-18. Claims 15-18 requires insert molding the heating means in direct contact with the thermally conductive mass. The thermally conductive mass further includes fluid flow path formed in the mass between an inlet and an outlet. Neither Wade nor Bochud

show or disclose a thermally conductive mass having a heating means insert molded in direct contact with the mass and a fluid flow path in the same mass. Bochud discloses molding the heating element to a reservoir, not to a mass having a flow path. It appears that the Examiner is using hindsight and the Applicant's own invention to form a case of obviousness. Therefore, Claims 15-18 is allowable over the cited prior art.

Claim 16 was rejected under 35 USC 103 (a) as being unpatentable over Bochud. The Examiner states that Bochud teaches the claimed invention except for an exclusive teaching of connecting a ground to the heating element. The Examiner alleges that it is well known in the art of fluid heating to connect a ground to the heating element for the reasons of safety. The rejection of claim 16 is traversed. Bochud does not teach the claimed invention. Bochud does not have the method step of providing a thermally conductive having at least one fluid flow path extending therethrough. As stated supra, Bochud does not disclose or show a fluid flow path extending through the mass. Bochud merely discloses a heater means molded to a reservoir and a tube running through the reservoir. The tube is not formed in the mass therein.

Claims 2-4 were rejected under 35 UCS 103(a) as being unpatentable over Wade in view of Cassidy. The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time the invention was made in view of Cassidy to modify the device of Wade to include a printed circuit board for controlling the heater. The rejection of claims 2-4 is traversed. The Cassidy reference is related to a wearable intravenous fluid heater. The field of wearable intravenous fluid heaters as disclosed by Cassidy is not analogous with a fluid heater for a vehicle windshield washing system. A person of ordinary skill in the art would not look to an intravenous fluid heater for controlling a fluid heater in a vehicle. Therefore claims 2-4 are believed to be allowable. Further claims 2-4 are dependent on allowable claim 1 and are therefore allowable.

Claims 5-7, and 10-12 were rejected under 35 USC 103(a) as being unpatentable over Wade in view of Rocchitelli. The rejection of claims 5-7 and 10-11 are traversed. Neither Wade nor Rocchitelli show or disclose a heating means insert molded in direct contact with thermally conductive mass. Further claims 5-7 and 10-12 are dependent on allowable claim 1 and are therefore allowable.

Claim 13 was rejected under 35 USC 103(a) as being unpatentable over Wade in view of Rocchitelli and further in view of common knowledge in the art as evidenced by Gusmer (US Patent No. 3782456). Claim 13 is dependent on allowable claim 1 and is therefore also allowable.

This amendment should place this case in condition for passing to issue. Such action is requested. If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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Tubular Heating Elements are a mineral insulated, metal-sheathec resistance heater. They are sometimes referred to as CalRod® Heate

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Components

ASB uses 80-20 ni-chrome wire, "A" grade magnesium oxide, and th quality tubing. Filling machines and roll reduction equipment are exp maintained to manufacturer's tolerances, and final test equipment is calibrated. You can expect high quality from us.

Tubular Heating Elements have 4 basic components:

1. Metal Sheath
2. Magnesium oxide (MgO)
3. Helix resistance coil
4. Cold section at each end

Tank Heaters
Drum Heaters
Immersion Heaters
Strip Heaters
Tubular Elements

Temperature Controls
Bulb and Capillary Controls
Analog Temperature Controls
Microprocessor Temperature Controls
1/32 DIN Temperature Controls
1/16 DIN Temperature Controls
1/8 Din Temperature Controls
1/4 Din Temperature Controls
Mercury Relays
Solid State Relays

Thermocouples
Accessories
Adjustable Bayonet
Mineral Insulated
Nozzle & Pipe Clamp
Plugs & Jacks
Ring Tongue & Shimstock
RTD Sensors
Terminations
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Tubular Heaters
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Technical Data
ASB Catalog Pages

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Here Is What Makes The ASB Tubular Heating Elements Your C Choice!

1. A variety of sheath materials are available for different application conditions. These take into account corrosion and temperature factor help[you choose the optimum sheath material to ensure the longest life for your application. Sheath materials include:

a. Steel
b. Copper
c. Titanium
d. Incoloy 800®
e. Incoloy 840®
f. Inconel 600®
g. 304 stainless steel
h. 316 stainless steel

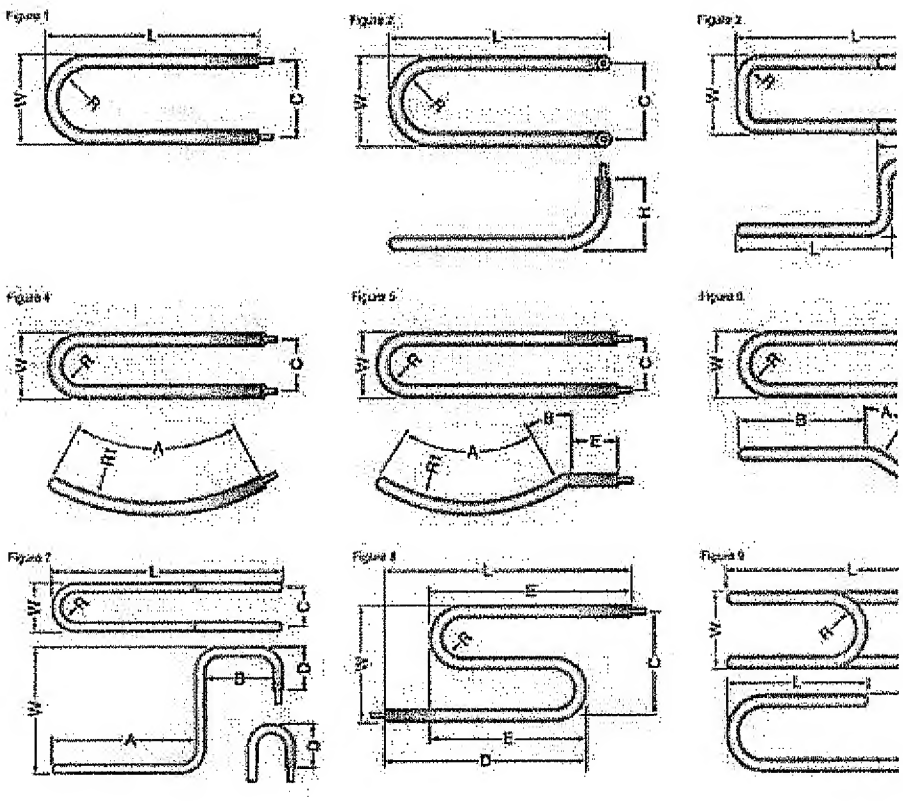
2. Only grade "A", High Purity, MgO is used in all ASB heaters. This n contributes to better heat transfer properties and higher electrical ins from the sheath. The result is a high quality heater which meets the demands of Industrial process applications.

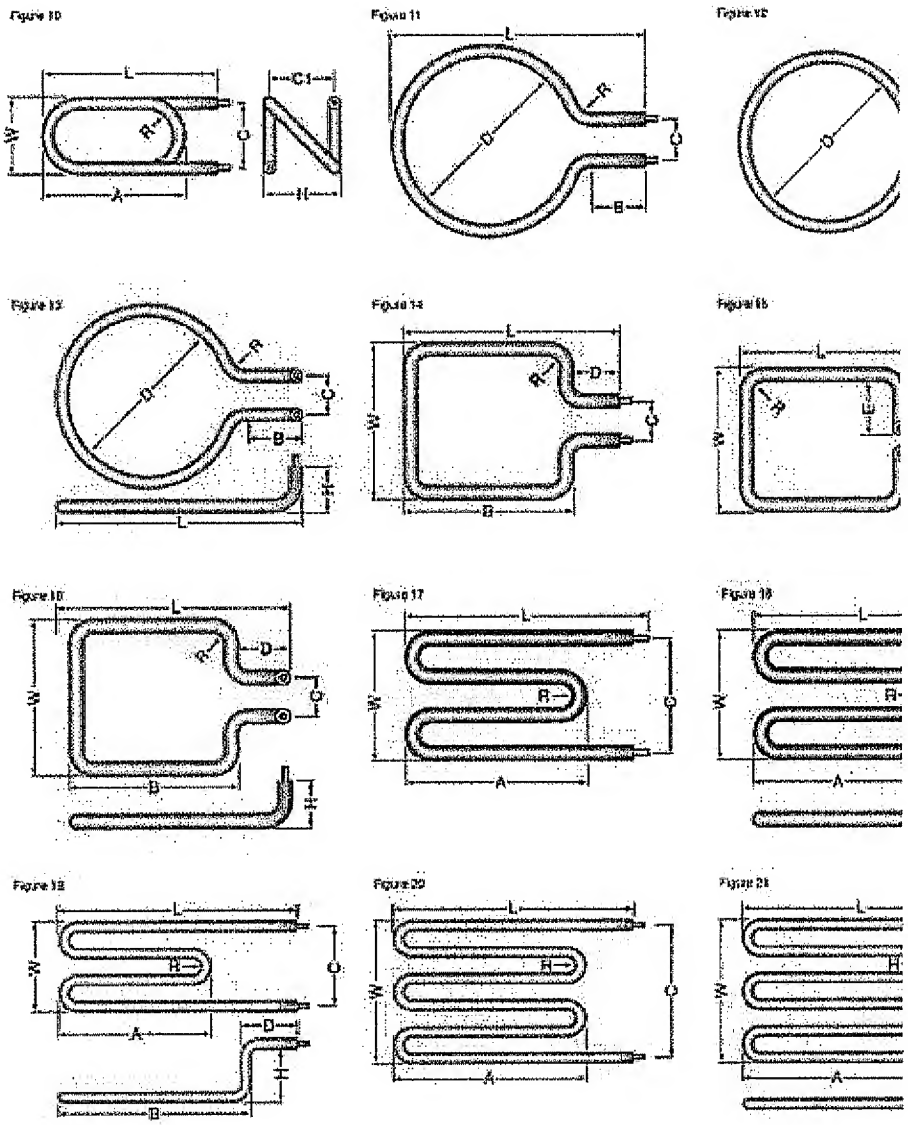
3. The resistance element in all heaters made by ASB is a premium g **80/20 Nickel-Chromium Alloy**. this material offers higher tempera capabilities and mechanical strength. As with the MgO insulation, a s heater component leads to a superior element.

4. The heater element requires a cold section at each end to keep th terminals from overheating. A steel pin of the desired length is used purpose. It is spot welded to the helix coil element for a secure conn the final step of assembly, the pin is exposed at each end of the elem ready to accept a variety of terminal options.

Why Are Tubular Heating Elements So Widely Accepted For Pr Heating?

- They are extremely rugged
- Can be formed into many unique and complex shapes
- Can be finned for improved forced air heat transfer
- Easy to precisely control the heat output to perfectly match yo requirements
- Low capital cost
- Negligible maintenance
- Can be used in virtually every industrial environment up to abo (540°C)
- Has a proven track record of over many years and applications

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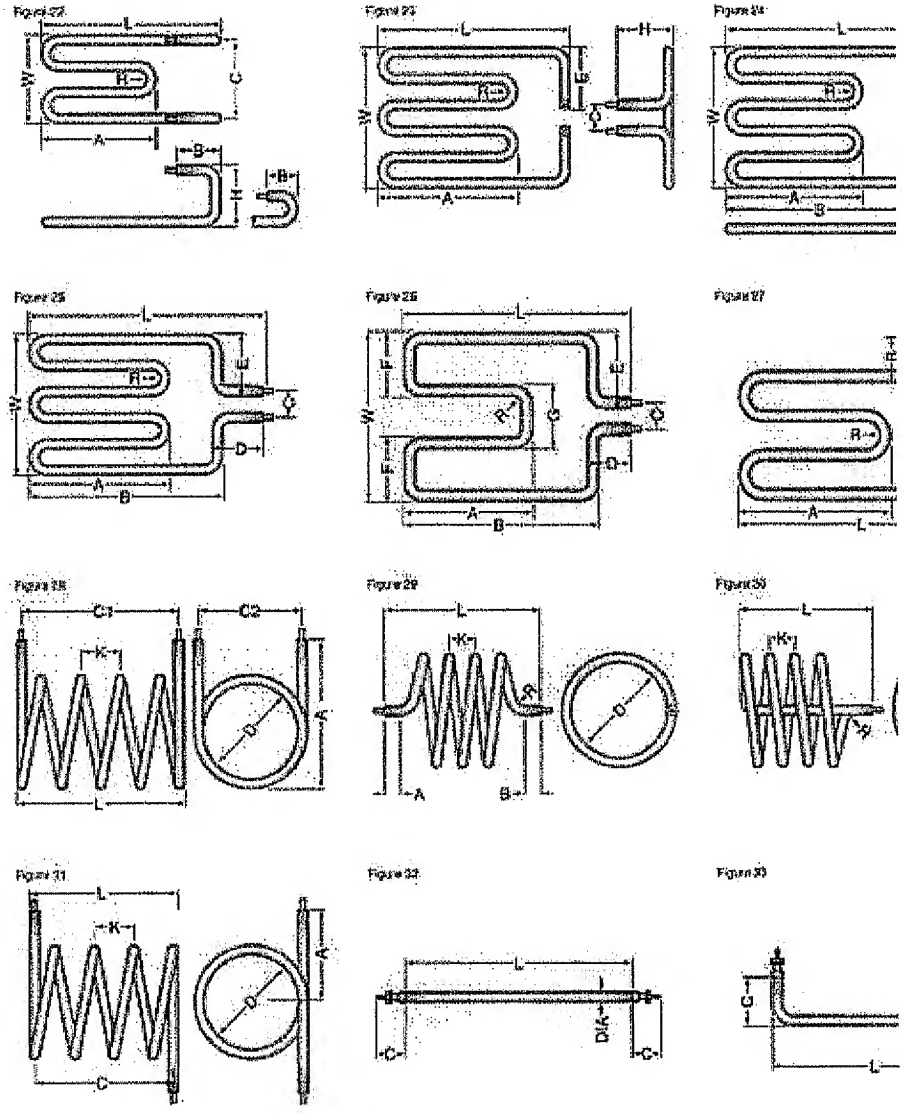

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Heaters

Optional Fittings

Parr has designed standard electrical heaters for all of the reactors in our pro Different types of heaters are used for individual reactors to best meet the op needs, heating load, and expected operating temperatures. The standard hea and power rating for each reactor model is listed in the reactor specification t standard designs will typically be one of the following:

Clamp-on Band Heater. These are normally used for very small reactors wh maximum watt densities and heat transfer are required due to the limited sur available on the vessel.

Rigid Heating Mantles. These are quartz fabric mantles housed in aluminun They are used on moderate sized reactors in designs where the heater can be or off the vessel. They are light weight and easy to handle, but they are not u support the weight of the vessel and they are generally limited to operating temperatures of 350° C or less.

Calrod-Type Sheathed Element Heaters. These are rugged heaters with C elements held within a metal shell. They are used for medium to large reactor operating temperatures to 350 °C. In some cases the heater shell itself forms the reactor support. An advantage of Calrod heaters is that the heating eleme easily replaceable.

Ceramic Heaters. These are special purpose heaters with an electric elemen embedded in a shaped ceramic body which is held within an insulated metal h They are used for reactors designed for temperatures to 600 °C and for large heaters.

Optional and Custom Heaters. Parr offers a variety of heater designs whicl substituted for the standard heater normally furnished with each reactor. Mos can also be used with Parr non- stirred pressure vessels as well. The principal and recommended applications for these heaters are described below.

Flexible Heating Mantles